Low-VOC ID Marking (LM)
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Project Summary

Current ink and paint formulations used for identification marking contain solvents that provide desirable properties, such as reduced viscosity for easier application. Some of the solvents, as well as liquid and solid wastes generated as a result of using these formulations, are considered to be hazardous and are subject to increasing environmental regulation. In addition to the increased operating costs imposed by these regulations (e.g., hazardous waste disposal), stenciling, stamping, and silk screening with current ink and paint formulations are very labor intensive, have the potential to produce illegible results, allow for possible operator error in entering number strings, and may be associated with potential operator health issues.

The Low-VOC Identification Marking project aimed to address these issues. Volatile Organic Compounds (VOCs), such as methyl ethyl ketone (MEK) and toluene as found in paint and epoxy resin-based inks, were identified as the target hazardous materials to be eliminated or reduced. An abundance of parts were addressed, including mechanical hardware and electronic components and alternatives tested included alternative ink stenciling and self-adhesive labeling.

The financial impact of implementing the alternatives was measured at two commercial facilities and four Department of Defense (DoD) sustainment facilities. The results of the preliminary cost analysis showed a potential cost avoidance of approximately $1 million per year at the six facilities and an $11 million net present value over the 15-year study period. This project has the potential to eliminate 1,300 lb/yr of VOC emissions and 9,800 lb/yr of hazardous waste at these facilities alone, with additional technology migration possible.

National Aeronautics and Space Administration (NASA) participated in a limited role by aiding in the development of the Joint Test Protocol (JTP) (http://www.jgpp.com/projects/id_marking/documents/idjtp.pdf). Some NASA substrates were incorporated into the JTP. The Space Shuttle Orbiter program conducted further tests on inks identified in this project, but none of the alternatives met all of their specifications. Further investigation of reformulated inks may provide solutions that better meet the specifications.